CLAIMS

1. An isolated polynucleotide comprising:

   a) a first nucleotide sequence that encodes a protein that exhibits interferon alpha type activity, and that hybridizes under stringent hybridization conditions to all or part of SEQ ID NO. 1, provided that the first nucleotide sequence comprises: (i) an adenine residue at nucleotide position 1318 or the equivalent position, or (ii) a thymine residue at nucleotide position 1423 or the equivalent position, or (iii) a thymine residue at nucleotide position 1456 or the equivalent position, or (iv) a mixture of any of (i), (ii) and (iii);

   b) a complementary nucleotide sequence that is strictly complementary to the first nucleotide sequence.

2. The isolated polynucleotide of claim 1, wherein the first nucleotide sequence comprises the cDNA or mRNA of SEQ ID NO. 1.

3. The isolated polynucleotide of claim 1, wherein the first nucleotide sequence has an identity of at least 90% with all or part of SEQ ID NO. 1.

4. The isolated polynucleotide of claim 3, wherein the first nucleotide sequence has an identity of at least 95% with all or part of SEQ ID NO. 1 and encodes a protein that exhibits interferon alpha-14 type activity.

5. The isolated polynucleotide of claim 4, wherein the first nucleotide sequence has an identity of at least 99% with all or part of SEQ ID NO. 1 and encodes a protein that exhibits human interferon alpha-14 type activity.

6. The isolated polynucleotide of claim 3, wherein an adenine residue is present at position 1318 or the equivalent position, and the presence of the adenine is due to a g1318a SNP or the same SNP at the equivalent position.

7. The isolated polynucleotide of claim 3, wherein a thymine is present at position 1423 or the equivalent position, and the presence of the thymine is due to a c1423t SNP or the same SNP at the equivalent position.

8. The isolated polynucleotide of claim 3, wherein a thymine is present at position 1456 or the equivalent position, and the presence of the thymine is due to a c1456t SNP or the same SNP at the equivalent position.

9. An isolated polynucleotide comprising:

a) a first nucleotide sequence that encodes a protein that exhibits interferon alpha activity, and that comprises all or part of SEQ ID NO. 1, provided that the first nucleotide sequence comprises: (i) an adenine residue at nucleotide position 1318 or the equivalent position, or (ii) a thymine residue at nucleotide position 1423 or the equivalent position, or (iii) a thymine residue at nucleotide position 1456 or the equivalent position, or (iv) a mixture of any of (i), (ii) and (iii); or

b) a complementary nucleotide sequence that is strictly complementary to the first nucleotide sequence.

10. An isolated polynucleotide comprising:

a) a first nucleotide sequence that encodes a protein that exhibits interferon alpha type activity, and that hybridizes under stringent hybridization conditions to all or part of SEQ ID NO. 1, provided that the first nucleotide sequence comprises one or more of a g451c, c542t, c742g, c804t, a875g, or g1512a SNP, or the same SNP(s) at an equivalent position(s); or

b) a complementary nucleotide sequence that is strictly complementary to the first nucleotide sequence.

11. The isolated polynucleotide of claim 10, wherein the first nucleotide

sequence comprises two or more of said SNPs.

12. The isolated polynucleotide of claim 10, wherein the first nucleotide sequence has an identity of at least 90% with all or part of SEQ ID NO. 1.

13. The isolated polynucleotide of claim 12, wherein the first nucleotide sequence has an identity of at least 95% with all or part of SEQ ID NO. 1 and encodes a protein that exhibits interferon alpha-14 type activity.

14. The isolated polynucleotide of claim 13, wherein the first nucleotide sequence has an identity of at least 99% with all or part of SEQ ID NO. 1 and encodes a protein that exhibits human interferon alpha-14 type activity.

15. An isolated polynucleotide comprising:

a) a first nucleotide sequence that encodes a protein that exhibits interferon alpha activity, and that comprises all or part of SEQ ID NO. 1, provided that the first nucleotide sequence comprises one or more of a g451c, c542t, c742g, c804t, a875g, or g1512a SNP, or the same SNP(s) at an equivalent position(s); or

b) a complementary nucleotide sequence that is strictly complementary to the first nucleotide sequence.

16. An isolated polynucleotide comprising:

a) a first nucleotide sequence that: (i) encodes a protein that exhibits interferon alpha activity, (ii) hybridizes under stringent hybridization conditions to all or part of SEQ ID NO. 1, (iii) has an identity of at least 99% with all or part of SEQ ID NO. 1, and (iv) comprises one or more of a c1298a or g1397a SNP, or the same SNP(s) at an equivalent position(s); or

b) a complementary nucleotide sequence that is strictly complementary to the first nucleotide sequence.

17. A host cell comprising a recombinant vector comprising the isolated polynucleotide of claim 1, 10 or 16.

18. An isolated polynucleotide that encodes a polypeptide comprising all or part of SEQ ID NO. 2, provided that the polypeptide exhibits interferon alpha type activity and comprises a G128E SNP or the same SNP at an equivalent position.

19. An isolated polynucleotide that encodes a polypeptide comprising all or part of SEQ ID NO. 2, provided that the polypeptide exhibits interferon alpha type activity and comprises an A163V SNP or the same SNP at an equivalent position.

20. An isolated polynucleotide that encodes a polypeptide comprising all or part of SEQ ID NO. 2, provided that the polypeptide exhibits interferon alpha-14 type activity and comprises a S174F SNP or the same SNP at an equivalent position.

21. A method for detecting an interferon alpha-14 nucleic acid sequence that is associated with a disease or resistance thereto, the method comprising: hybridizing to the interferon alpha-14 nucleic acid sequence a second nucleic acid sequence that (i) has an identity of at least 99% with all or part of SEQ ID NO. 1 or the strict complement thereof, and (ii) comprises one or more of a g1318a, c1423t or c1456t SNP, or the same SNP(s) at an equivalent position(s), or the complement(s) of said SNP(s).

22. A method for detecting an interferon alpha-14 nucleic acid that is associated with a disease or resistance thereto, the method comprising:

a) providing a sample comprising a nucleic acid that has an identity of at least 99% with all or part of SEQ ID NO. 1 or the strict complement thereof,

b) hybridizing an oligonucleotide to a portion of the nucleic acid that is adjacent to nucleotide residue position 1456 or an equivalent position;

c) elongating the oligonucleotide in a solution comprising either a labeled dideoxynucleotide complementary to thymine if the detecting is carried out on the sense strand, or a labeled dideoxynucleotide complementary to adenine if the detecting is carried out on the antisense strand; and

d) detecting in the elongated oligonucleotide the presence or absence of the labeled dideoxynucleotide at position 1456 or an equivalent position.

23. A method for detecting an interferon alpha-14 nucleic acid that is associated with a disease or resistance thereto, the method comprising:

a) providing a sample comprising a nucleic acid that has an identity of at least 99% with all or part of SEQ ID NO. 1 or the strict complement thereof,

b) hybridizing an oligonucleotide to a portion of the nucleic acid that is adjacent to nucleotide residue position 1423 or an equivalent position;

c) elongating the oligonucleotide in a solution comprising either a labeled dideoxynucleotide complementary to thymine if the detecting is carried out on the sense strand, or a labeled dideoxynucleotide complementary to adenine if the detecting is carried out on the antisense strand; and

d) detecting in the elongated oligonucleotide the presence or absence of the labeled dideoxynucleotide at position 1423 or an equivalent position.

24. A method for detecting an interferon alpha-14 nucleic acid that is associated with a disease or resistance thereto, the method comprising:

a) providing a sample comprising a nucleic acid that has an identity of at least 99% with all or part of SEQ ID NO. 1 or the strict complement thereof,

b) hybridizing an oligonucleotide to a portion of the nucleic acid that is

adjacent to nucleotide residue position 1318 or an equivalent position;

c) elongating the oligonucleotide in a solution comprising either a labeled dideoxynucleotide complementary to adenine if the detecting is carried out on the sense strand, or a labeled dideoxynucleotide complementary to thymine if the detecting is carried out on the antisense strand; and

d) detecting in the elongated oligonucleotide the presence or absence of the labeled dideoxynucleotide at position 1318 or an equivalent position.

25. A method for determining statistically relevant associations between a disease or disease resistance and one or more of a g451c, c542t, c742g, c804t, a875g, c1298a, g1318a, g1397a, c1423t, c1456t, or g1512a SNP, or the same SNP(s) at an equivalent position(s), comprising:

a) genotyping a sample of individuals with respect to said SNP(s);

b) determining the distribution of said disease or resistance within the sample;

c) comparing the genotype data with the distribution of said disease or resistance; and

d) analyzing the comparison for statistically relevant associations.

26. A method for diagnosing a disease, or determining a prognosis of or resistance to the disease, in an individual, comprising: determining whether an interferon alpha-14 gene of the individual comprises one or more of a g451c, c542t, c742g, c804t, a875g, c1298a, g1318a, g1397a, c1423t, c1456t, or g1512a SNP, or the same SNP(s) at an equivalent position(s).

27. An isolated polypeptide comprising a peptide sequence having an identity of at least 90% identity with:

a) the amino acid sequence of SEQ ID NO. 2, or

b) the amino acid sequence of amino acids 24 through 189 of SEQ ID NO.

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provided that the peptide sequence comprises: (i) a glutamic acid at amino acid position 128 or the equivalent position, or (ii) a valine at amino acid position 163 or the equivalent position, or (iii) a phenylalanine at amino acid position 174 or the equivalent position, or (iv) a mixture of any of (i), (ii) and (iii);

28. The isolated polypeptide of claim 27, wherein the peptide sequence has an identity of at least 95% with the amino acid sequence of a) or b).

29. The isolated polypeptide of claim 28, wherein the peptide sequence has an identity of at least 99% with the amino acid sequence of a) or b).

30. The isolated polypeptide of claim 27, wherein a glutamic acid is present at amino acid position 128 or the equivalent position, and the presence of the glutamic acid is due to a G128E SNP or the same SNP at the equivalent position.

31. The isolated polypeptide of claim 27, wherein a valine is present at amino acid position 163 or the equivalent position, and the presence of the valine is due to a A163V SNP or the same SNP at the equivalent position.

32. The isolated polypeptide of claim 27, wherein a phenylalanine is present at amino acid position 174 or the equivalent position, and the presence of the phenylalanine is due to a S174F SNP or the same SNP at the equivalent position.

33. An antibody immunospecific for the isolated polypeptide of claim 30, 31, or 32.

34. A method for treating or preventing a disease or disorder linked to interferon alpha-14, comprising administering to an individual a therapeutically

effective amount of a therapeutic agent that comprises the isolated polypeptide of claim 30, 31, or 32 with a pharmaceutically acceptable excipient.

35. A method for preventing or treating cancers, tumors, or immunological diseases, comprising administering to an individual a therapeutically effective amount of a therapeutic agent comprising the isolated polypeptide of claim 30, 31, or 32 with a pharmaceutically acceptable excipient.

36. A method for preventing or treating a viral disease, comprising administering to an individual a therapeutically effective amount of a therapeutic agent comprising the isolated polypeptide of claim 30, 31, or 32 with a pharmaceutically acceptable excipient.

37. A method for identifying a compound with an activity substantially similar to an activity of an interferon alpha-14 protein that comprises a S174F SNP, or the same SNP at an equivalent position, comprising:

a) determining whether or the extent to which said compound exhibits an activity selected from the group consisting of dendritic cell maturation, cytokine release by CD4+ or CD8+ T-lymphocytes, cytokine release by monocytes, *in vitro* or *in vivo* antiviral activity, cellular antiproliferative activity on Daudi Burkitt's cell lines, cellular antiproliferative activity on TF-1 cell lines, *in vitro* or *in vivo* antiviral activity, and any combination of the foregoing activities; and

b) comparing the activity determined in step a) with the activity of said interferon alpha-14 protein.

38. A method for identifying a compound with an activity substantially similar to an activity of an interferon alpha-14 protein that comprises a G128E or A163V SNP, or the same SNP(s) at an equivalent position(s), comprising:

a) determining whether or the extent to which said compound exhibits an

activity selected from the group consisting of dendritic cell maturation, cytokine release by CD4+ or CD8+ T-lymphocytes, cytokine release by monocytes, *in vitro* or *in vivo* antiviral activity, cellular antiproliferative activity on Daudi Burkitt's cell lines, cellular antiproliferative activity on TF-1 cell lines, *in vitro* or *in vivo* antiviral activity, and any combination of the foregoing activities; and

b) comparing the activity determined in step a) with the activity of said interferon alpha-14 protein.

39. A therapeutic agent comprising one or more compounds selected from the group consisting of:

a) an isolated polynucleotide comprising: (i) a first nucleotide sequence that has an identity of at least 90% with all or part of SEQ ID NO. 1 or the coding region thereof, provided that the first nucleotide sequence has one or more of an adenine at nucleotide position 1318 or the equivalent position thereto, or a thymine at nucleotide position 1456 or the equivalent position thereto, or (ii) a complementary nucleotide sequence that is strictly complementary to the first nucleotide sequence;

b) a recombinant vector comprising said isolated polynucleotide or the cDNA or mRNA thereof;

c) a host cell comprising said recombinant vector;

d) an isolated polypeptide comprising (i) a peptide sequence that has an identity of at least 90% with SEQ ID NO. 2, provided that said polypeptide comprises a G128E or S174F SNP or the same SNP(s) at the equivalent position(s), or (ii) a portion of said polypeptide comprising said SNP(s) provided that the portion of the polypeptide exhibits substantially the same biological activity as the mature or immature form of the polypeptide; and

e) any combination of the compositions of a), b), c), or d).